STATE BUILDING ENERGY MANAGEMENT PROGRAM

STATUS REPORT
2006

Annual Statewide Energy Costs

The State of Tennessee spent approximately $72 million for energy to operate the approximately 72,000,000 square feet of state-owned buildings in 1988. Currently, there are eleven executive branch agencies, the Tennessee Board of Regents and the University of Tennessee System that own and/or operate the more than 6,640 buildings. As of June 30, 2006 those Executive branch agencies and the Tennessee Higher Education Commission actually spent more than 129 million dollars on energy for 92,000,000 square feet of space, reflecting a 79% increase in 19 years.

Significant increases in energy costs to the state were experienced in the latest reporting period. While annual costs have been escalating at a fairly consistent annual rate of 2.2%, the latest year for which data is available saw total energy costs rise by a rate of 12.5%. Interestingly, energy costs are currently projected to be essentially flat through 2011[1] after which time costs are expected to escalate at an increasing annual rate as illustrated in Fig. 1.

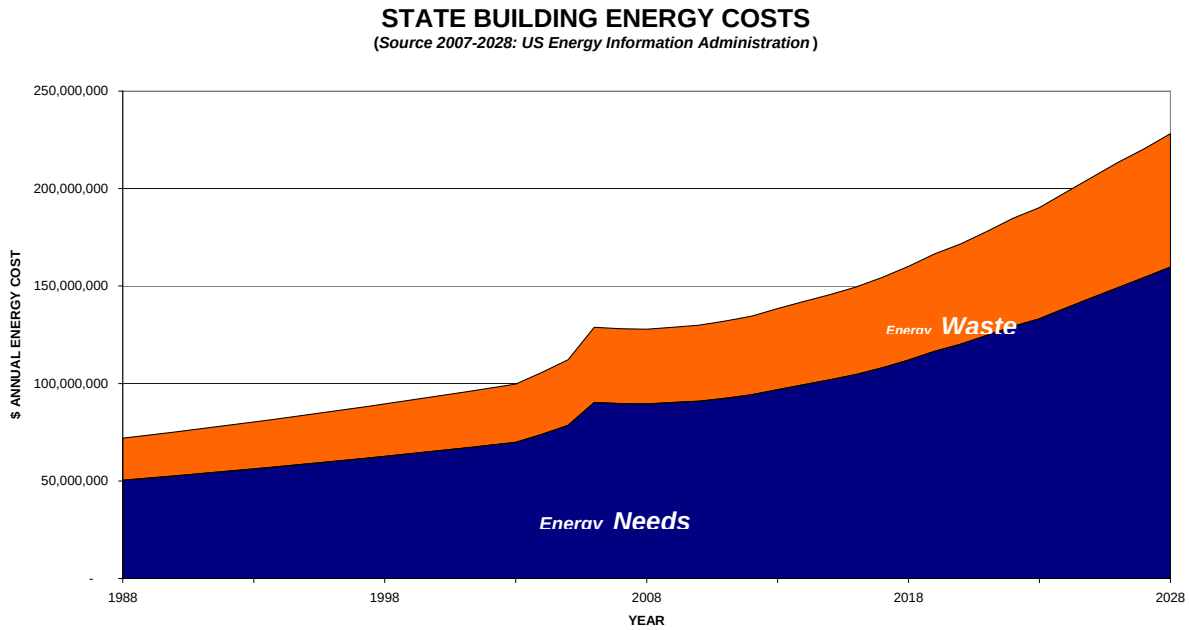

FIG. 1

Figure 1, based on the graph originally included in the "Energy Action Plan for Tennessee Buildings" (2000, revised 2001) indicates estimated potential savings in energy consumption

[1] Source: U.S. Energy Information Agency

and operational costs (not accounting for measures already taken through completed energy projects).

"Energy Action Plan for Tennessee Buildings"

This action plan, prepared in 2001, defined the broad range of goals and objectives of SBEM. Approximately 80% of state owned building space, 54.8 million square feet was committed under specific voluntary partnership agreements with state departments, agencies, colleges, universities and other institutions. Energy conservation and savings efforts were reinforced by applicable statutes (T.C.A. 4-3-1107, 1108, 1110, 1111). The statutes require that all executive branch agencies, the Tennessee Board of Regents and the University of Tennessee support and participate in the implementation of the referenced statutes if so mandated by executive order. Participation is currently voluntary. The Department of General Services, Tennessee Board of Regents, the Tennessee Department of Environment & Conservation, the University of Tennessee, Tennessee Department of Correction and TRICOR, all signed voluntary Agency Partnership Agreements.

Since 2001 the state-owned building space has since increase to approximately 92,000 square feet.

Energy Management Technical Support

- Assistance is in progress at four regional prisons for the Department of Corrections, a geothermal heat pump project at the Northwest Correctional Complex, (prototypical Prison design using a computer simulation). The Department of Engineering at UT Martin undertook a major study, including collection and analysis of performance data, of the geothermal heat pump project. The study was funded by TDOC with instrumentation furnished by SBEM. The results, summarized and presented September 16, 2005 conclusively demonstrated the potential reduction in energy consumption for heating, cooling and water heating resulting from application of geothermal technology.

- Technical assistance at the Andrew Jackson/Rachel Jackson buildings (AJ/RJ) by means of energy audits, operational procedures and maintenance schedule studies, monitoring HVAC systems and air handlers, electric motor testing, light levels, steam and chilled water demands and the like, resulted in the creation of a $4.5 million dollar project with the TVA/NES acting as the Energy Services Company. This project has saved the State Of Tennessee, $1,539,923 for (FY 04-05 and FY 05-06) since substantial completion in 2005.

- The Governor's residence is under going a major renovation and facelift. From the beginning of this project the SBEM was asked to suggest energy efficient products and services to the designers for consideration. It was decided early in the project that space heating and cooling and the heating of hot water would utilize geothermal technology. The use of energy efficient windows and doors were utilized, insulation

added, and several other energy efficient measures were adopted during the design phase of the project.

- The downtown state office buildings have all had preliminary energy assessments done in conjunction with two consulting firms in a report submitted to the State of Tennessee in May 2002. The report, **Energy Conservation Potential Analysis**, has been instrumental in determining energy efficiency measures that can be initiated, principally through capital projects. Energy savings according to the report is in the $2.6 million dollar range annually. The ongoing energy project at the James K. Polk, Davy Crockett and Andrew Johnson Buildings will reduce energy costs at that facility by at least $369,000 dollars annually.

- The State Building Energy Management Program is continuing to provide technical support for the new Bledsoe County State Prison through the ongoing process of "value engineering". SBEM was involved in the initial planning and feasibility of heating and cooling systems for the new prototypical prison. Now that further study of that design is being undertaken, SBEM is still actively involved. This project will incorporate LEED (Leadership in Energy and Environmental Design) design criteria.

- Ongoing technical support for the Department of Health's new Upper Cumberland Health Services building in Cookeville as a more sustainable design and possible LEED certification for the new facility is sought.

- The Metro District Energy System that supplies steam and chilled water to the state buildings downtown has worked with SBEM in their metering program that will provide essential data to the state and the utility regarding the energy usage of state buildings served by Metro DES. Additionally, SBEM provides ongoing technical support to the Department of General Services on other matters relating to the state's contract with Metro DES.

Statewide Energy Accounting System (SEAS)

A statewide energy accounting initiative was started in 1989. Energy consumption and costs have been recorded in energy accounting software called FASER, and is the standard for recording the states energy consumption and cost to date. The data collected thus far has become instrumental in the setting of baselines for performance contracting and the development of energy savings projects. In July 2000, SEAS was successfully implemented at twenty-two additional sites in an attempt to further expand the project statewide. June 2001, another software project was initiated to expand the use of SEAS to all agencies receiving energy and utility bills. This project is began during in FY 2003. The SEAS program is to be implemented as new agencies come on board with facility energy retrofit projects and will be used for M&V, and utility data tracking.

Energy Savings Performance Contracting

Commonly, "performance contracting" entails the use energy services companies (ESCO's) to develop, fund and implement projects. The ESCO's are then compensated through guaranteed energy savings resulting from the projects. The state does not utilize this method of funding energy projects, but instead funds them in like manner to other capital projects. Management of capital projects intended to reduce energy costs across the state represent the single largest commitment of manpower within SBEM.

Tennessee Board of Regents

- In the spring of 2001 the SBC approved a $10 million-dollar performance contract for MTSU and an $8.5 million-dollar project at TSU. ESPC contracts were awarded to Siemens Building Technologies in separate competitive procurements for each site. Not long after these contracts were awarded, the TBR issued an RFP for all the remaining TBR sites not presently under (ESPC) contract. In November 2002, the TBR awarded the contract for a system wide ESPC to three different ESCOs, LG&E Enertec, Siemens Building Technologies, and Energy Systems Group (ESG). They currently have $35,000,000 in energy projects underway with a projected savings of at least $4,500,000 annually. The TBR spent more than $40 million dollars in FY 2005-2006 for energy.

University of Tennessee System

- The state building commission approved energy projects for UT Chattanooga in the amount of $4.5 million dollars and UT Memphis in the amount of $3.0 million dollars in the fall of 2001. The UT system does not utilize a performance contracting process with the associated measurement and verification of savings to execute projects that reduce energy costs. The University of Tennessee spent more than $33 million dollars in FY 2005-2006 for energy.

Department of General Services (FRF)

- In January 2001 SBC approved a $4.5 million dollar performance contract awarded to TVA/NES ESCO for the Andrew Jackson/Rachel Jackson Buildings. Measured savings from this project since completion are $1,539,900 (FY 04-05 and FY 05-06).

- An energy project is currently underway at the James K. Polk, Andrew Johnson and Davy Crockett Buildings in Nashville with an annual savings of $395,900 at an associated cost of $3,888,000.

- SBEM with the Department of General Services is developing a project to compare two identical state-owned buildings in downtown Nashville, one with a lighting retrofit and one without, to determine the cost savings. The results can be extrapolated to predict savings in other, similar buildings around the state.

Other Agencies and Departments

- Executive Branch Agencies also have projects completed or under construction in the amount of $5,685,000[2] with total annual energy savings of $525,570. Additionally, funded projects are currently in development with a combined capital cost of $17,239,000[3] with expected annual savings of $1,959,000

[2] Projects include some capital maintenance (non-energy or limited energy) items necessary for complete, functional projects. Capital costs reflect full, appropriated amounts. Actual contracts are typically less.
[3] Ditto